

CLAIMS

1. A method of production of objects from thermosetting resin according to the following stages:

5 a- preparation of a formulation based on thermosetting materials
 b- recovery and optional storage of the formulation prepared in a
 c- production of finished objects by processing of the product obtained in b by the processing techniques that are usually restricted to thermoplastics.

10 2. The method as claimed in claim 1, characterized in that a formulation is prepared by extrusion, calendering or dissolution in a reactor, said formulation comprising:

- from 1 to 80 wt.% of the total weight of the formulation, of a rheology-regulating agent (I) comprising at least one block copolymer selected from the S-B-M, B-M and M-B-M block copolymers in which:

15 • each block is joined to the next by a covalent bond or by an intermediate molecule joined to one of the blocks by a covalent bond and to the other block by another covalent bond,
 • M is a homopolymeric PMMA or a copolymer comprising at least 50 wt.% of methyl methacrylate,
 • B is incompatible with the thermosetting resin and with block M and its glass transition temperature Tg is below the service temperature of the thermoset,
 • S is incompatible with the thermosetting resin, block B and block M and its Tg or its melting point Tm is above the Tg of B,

- from 20 to 99 wt.% of the total weight of the formulation, of at least one thermosetting material (II),

- from 0 to 50 wt.% of the total weight of the formulation, of at least one thermoplastic material (III),

the formulation can additionally contain organic and inorganic fillers such as fibers, pigments, UV absorbers and/or fillers for improving fire resistance.

30 3. The method as claimed in claim 2, characterized in that in the course of stage (a) the thermosetting material (II) is mixed with the agent (I) in processing conditions with slow reaction kinetics of (II), then in a second stage in which reaction is initiated by raising the temperature or by any other means.

4. The method as claimed in claim 2 or 3, characterized in that the M blocks of the block copolymers comprise PMMA that is syndiotactic to at least 60%.

5. The method as claimed in one of the claims 2 to 4, characterized in that the M blocks of the block copolymers comprise reactive monomers, advantageously glycidyl methacrylate, tert-butyl methacrylate or acrylic acid.

6. The method as claimed in one of the claims 2 to 5, characterized in that the Tg of the B blocks of the block copolymers is below 0°C, and preferably below -40°C.

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7. The method as claimed in one of the claims 2 to 6, characterized in that the B blocks of the block copolymers are mainly comprised of polybutadiene-1,4.

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8. The method as claimed in one of the claims 2 to 7, characterized in that the dienes of the B block are hydrogenated.

9. The method as claimed in one of the claims 2 to 6, characterized in that the B block comprises poly(butyl acrylate).

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10. The method as claimed in one of the claims 2 to 9, characterized in that the Tg or the Tm of S is above 23°C and preferably above 50°C.

11. The method as claimed in one of the claims 2 to 10, characterized in that S is polystyrene.

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12. The method as claimed in one of the claims 2 to 11, characterized in that the number-average molecular weight of the block copolymers can be between 10000 g/mol and 500000 g/mol.

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13. The method as claimed in one of the claims 2 to 12, characterized in that the number-average molecular weight of the block copolymers can be between 20000 g/mol and 200000 g/mol.

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14. The method as claimed in one of the claims 2 to 13, characterized in that the proportion of agent (I) is from 1 to 35% for respectively 99 to 65% of (II) and advantageously

from 8 to 32% for respectively 92 to 68% of (II).

15. The method as claimed in one of the claims 2 to 14, characterized in that the regulating agent (I) comprises at least one of the block copolymers M-B-M, S-B-M and at least 5 one polymer selected from core-shells (A), functionalized elastomers, S-B block copolymers and ATBN or CTBN reactive rubbers.

16. The method as claimed in one of the claims 2 to 15, characterized in that the blocks S and B of the S-B diblock are those of claims 7 to 11.

10 17. The method as claimed in claim 16, characterized in that the S-B diblock has a number-average molecular weight between 10000 g/mol and 500000 g/mol.

15 18. The method as claimed in one of the claims 2 to 17, characterized in that the impact modifier comprises at least one S-B-M block copolymer and at least one S-B block copolymer.

19. The method as claimed in one of the claims 2 to 18, characterized in that the impact modifier comprises at least one S-B-M block copolymer and at least one core-shell polymer (A).

20 20. The method as claimed in one of the claims 2 to 19, characterized in that the impact modifier comprises at least one S-B-M block copolymer, at least one ATBN or CTBN reactive rubber and optionally an S-B block copolymer.

25 21. The method as claimed in one of the claims 2 to 20, characterized in that all or part of the S-B-M triblock is replaced with an M-S-B-S-M or M-B-S-B-M pentablock.

22. The method as claimed in one of the claims 2 to 21, characterized in that the thermosetting resin is a thermosetting epoxy resin and a hardener.

30 23. The method as claimed in one of the preceding claims, characterized in that the product obtained in b is in the form of granules.

24. The method as claimed in claim 23, characterized in that the granules are stored without time limitation.

25. The method as claimed in one of the claims 1 to 22, characterized in that the product obtained in b is in the form of sheet.

5 26. The method as claimed in one of the claims 1 to 22, characterized in that the product obtained in b is in the form of film.

27. The method as claimed in claim 27 or 28, characterized in that the sheet or film is stored without time limitation at a temperature below 0°C.

10 28. The method as claimed in one of the preceding claims, characterized in that the finished object according to c is a tube.

29. The use of the tube of claim 28 for high-pressure or high-temperature applications.

15 30. The method as claimed in one of the claims 1 to 27, characterized in that the finished object according to c is a plate.

31. The use of the plate of claim 30 as a material that can be thermoformed and used in the automobile industry.

20 32. The method as claimed in one of the claims 1 to 27, characterized in that the finished object according to c is sheet.

25 33. The use of the sheet of claim 32 as a material intended for electrical and electronic applications.

34. The method as claimed in one of the claims 1 to 27, characterized in that the finished object according to c is film.

30 35. The use of the film of claim 34 as a material intended for coating applications.